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REMARKS

In response to the Final Office Action, Claim 1 is amended. Claims 1-7 remain in the Application. Reconsideration of the pending claims is respectfully requested in view of the above amendments and the following remarks.

Notwithstanding that this is a Final Office Action, the amendment to Claim 1 merely promotes clarity and does not raise any new issue. Accordingly, entry of the amendment is respectfully requested.

I. Claims Rejected Under 35 U.S.C. § 103(a)

Claims 1-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2001/0028209 to Uemura et al. ("Uemura") in view of U.S. Patent Publication No. 2004/0095050 to Liu et al ("Liu").

To establish a *prima facie* case of obviousness, the relied upon references must teach or suggest every limitation of the claim such that the invention as a whole would have been obvious at the time the invention was made to one skilled in the art.

Amended Claim 1 recites:

"A method of manufacturing an electron-emitting source, comprising the steps of:

forming a film containing curled nanotube fibers on a substrate;

and

irradiating the film formed on the substrate with a laser beam perpendicularly to the substrate, wherein the step of irradiating includes the step of disconnecting the curled nanotube fibers by the laser beam to increase the number of ends of the curled nanotube fibers" (emphasis added).

Applicants submit that the cited references do not teach or suggest the element of "disconnecting the curled nanotube fibers by the laser beam to increase the number of ends of the curled nanotube fibers."

The Examiner relies on Uemura for disclosing the curled nanotubes and Liu for disclosing the irradiating operations. Liu discloses irradiating nanotubes disposed substantially perpendicularly to a substrate with a laser beam in order to remove excess amorphous carbon depositing on the nanotubes to thereby control their heights. However, Liu does not teach or suggest that the irradiation increases the number of ends of the curled nanotube fibers. Rather,

Liu discloses cutting off the tips of the carbon nanotubes that are disposed substantially perpendicularly to a substrate in order to control their heights. In particular, FIG. 1 and FIG. 3 of Liu show the nanotube fibers after and before the irradiation, respectively. The numbers of ends of the nanotube fibers in both figures are the same. Thus, in Liu, the irradiation merely trims the tips of the nanotube fibers, but does not increase the number of ends of the nanotube fibers.

The present invention features curled nanotubes fibers that are disconnected by a laser beam to create open ends. Thus, the curled nanotube fibers are fragmented into pieces under the laser beam to increase open or free ends and act as emission sites.

To describe this in greater detail, the laser irradiation acts to fragment the curled nanotube fibers so as to widen or open the meshes thereof. (See, description of FIGS. 5 and 6.) That is, as a result of the fragmentation, the film 7 (FIG. 1) will have increased open ends of the curled nanotube fibers at its surface layer. In addition to this, the widened meshes of the curled nanotube fibers allows an electric field to more readily reach the ends of nanotube fibers located in lower layers of the film that have been hidden under denser nanotubes in upper layers of the film before the fragmentation. Thus, according to the present invention, these features work synergistically to increase such free or open ends of the nanotubes that serve as emission sites.

In the Final Office Action, on page 2, paragraph 3, lines 7-10, the Examiner asserts that "Liu also discusses freeing more ends of nanotubes by this procedure because the tips of the invention contribute to a decreased threshold voltage required for field emission (paragraph 0026)." However, the feature of freeing more ends of nanotubes is not discussed anywhere in Liu. The "deceased threshold voltage" mentioned by Liu in paragraph 0026 does not involve increasing the number of ends of the nanotubes. Applicants have been unable to identify any passage in Liu that describes or suggests the feature of increasing the free or open ends of nanotube fibers. Thus, Applicants request that the Examiner more clearly identify the portion of Liu that supports the Examiner's assertion.

Moreover, there is no motivation to combine the references. Liu discloses cutting off the tips of the nanotubes that are disposed substantially perpendicularly to a substrate in order to control their heights. The specification and the drawings of Liu disclose that the nanotubes are vertically oriented with respect to the substrate and substantially perpendicular to the substrate. Thus, a skilled person in the art would not be motivated to replace the perpendicular nanotubes

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of Liu by the curled nanotubes of Uemera because doing so would be contrary to the vertical and perpendicular structure taught by Liu.

In regard to Claims 2-7, these claims depend from Claim 1 and incorporate the limitations thereof. Thus, at least for the reasons mentioned above in regard to Claim 1, these claims are non-obvious over Uemera in view of Liu. Accordingly, reconsideration and withdrawal of the § 103 rejection of Claims 1-7 are respectfully requested.

**CONCLUSION**

In view of the foregoing, it is believed that all claims are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666.

Respectfully submitted,

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Marilyn Bass

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